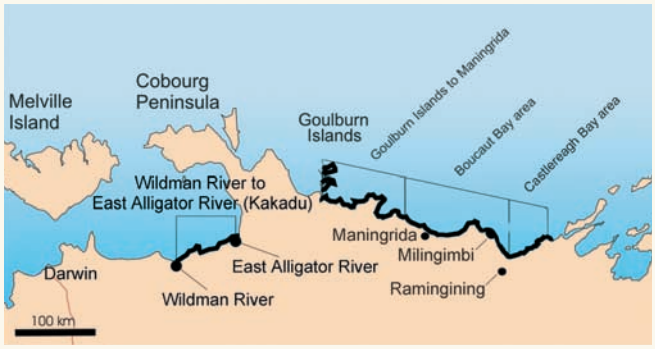
Teamwork for a survey of sea country

Typically extensive *Thalassodendron* seagrass meadows around South Goulburn Island off the Northern Territory. Anthony Roelofs

Australia's expansive northern marine environment is relatively unknown to modern science. Now the coastal waters stretching from Kakadu National Park, across Arnhem Land to the Gulf of Carpentaria and the Torres Strait are under the microscope – some for the first time. In a landmark initiative, Indigenous people have informed and taken part in a scientific survey of the region, the results of which are to become an integral baseline for cooperative management.



The Northern Marine Biodiversity Survey study area. Neil Smit

Not since British surveyors and naturalists ploughed the waters of the Arafura Sea in the early 1800s, in ships such as the *Mermaid* and the *Beagle*, has Australia's northern coastline been under such scientific scrutiny. The Northern Australian Marine Biodiversity Survey (NAMBS) was designed to assist in the better management of the northern Australian waters by Australian and Northern Territory Government agencies, but it will also help Aboriginal communities in the region to share and improve their own knowledge of the marine environment and engage in marine management programs.

'It is hoped that this survey, amongst the first of its kind in a marine environment, will open up new opportunities for information sharing and collaboration between Indigenous groups, research organisations and government. As Aboriginal people comprise the majority of the population in the Northern Planning Area, and are landowners for much of the coastline, incorporation of their knowledge and their involvement in management processes are critical to the long-term health of the marine environment,' said Rowan Wylie, the Director responsible for the National Oceans Office regional marine planning processes for northern Australia.

'The Aboriginal people have such a vast knowledge of the marine environment, the individual species and the relationships between them,' says Mr Paul Josif, a Coordinator with the Northern Land Council. 'By engaging Aboriginal people in western scientific research, and respecting and valuing their knowledge, there is great potential for both sides to learn from each other, to build the capacity of both knowledge "blackboards" and so better manage natural resources all round.'

Knowledge gaps

A lack of baseline information on marine environments has been identified by the Director of National Parks for the eastern Van Diemen Gulf, including waters adjacent to the Kakadu National Park boundary. The NAMBS reflects the wishes of Traditional Owners and of Kakadu National Park management to cooperatively obtain information and to improve the limited understanding of the marine environments in and adjacent to Kakadu. Kakadu's Traditional Owners and park management are also aiming strengthen

Progress

relationships with the Northern Territory government to inform future management options for the marine environment of the Van Diemen Gulf.

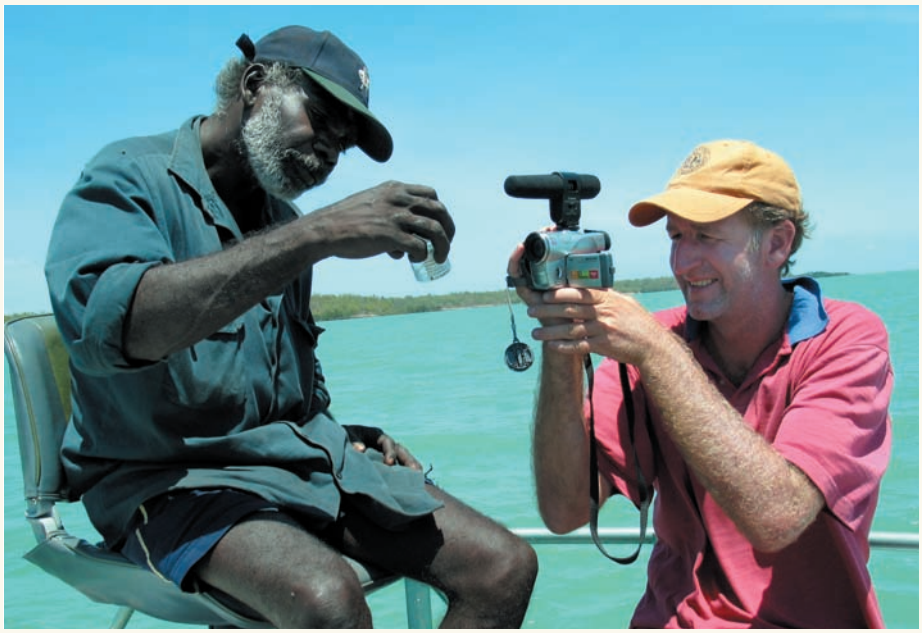
The regional marine planning process – overseen by the National Oceans Office – aims to provide an ecosystem-based framework for the integrated management of activities in Commonwealth waters. A South-East Regional Marine Plan is already in place for waters around Tasmania, New South Wales, South Australia and Victoria, while the Northern Regional Marine Plan, encompassing the eastern Arafura Sea, Gulf of Carpentaria and Torres Strait, will be completed next year.

The Northern Planning Area is a massive 700 000 km^2. Managing it effectively requires an understanding of species diversity and distribution, and its economic, social, ecological and cultural values. In 2003, expert reports were commissioned by the National Oceans Office to review the current state of knowledge of key species with commercial, recreational, cultural and conservation significance in the area. Other work collated existing social, economic, environmental, cultural, and management knowledge, and integrated information about Aboriginal associations, rights, responsibilities, use and management of the region's marine environments.

These assessments highlighted large information gaps in the scientific knowledge of many marine species groups, including seagrasses, mangroves, turtles, corals and various fishes. They advised that basic information was needed to create a baseline from which future impacts and trends in populations can be monitored. In recognition of Aboriginal peoples' unique understanding of, and interests in this remote coastline, the gathering and application of Indigenous knowledge was also identified as integral for effective management of these species.

Seagrass' habitats, highlighted as a key, but poorly studied, component of northern Australia's marine ecosystems, were selected to form the major focus of the survey.

'Seagrasses are ecologically important plants. They stabilise coastal sediments, provide food and shelter for diverse organisms, act as a nursery ground for shrimp and fish of commercial importance, and play a role in nutrient trapping and recycling,' says Dr Barry Russell, Assistant Director of the Museum and Art Gallery of the Northern Territory, and survey coordinator.



Colin Dudanga (Djelk Rangers, Maningrida) and Terry Mahney (NLC) record Indigenous ecological knowledge in Rolling Bay near Maningrida. Northern Land Council

'Because seagrasses are fragile, they are good indicators of pollution or disturbance; and dugongs and sea turtles, which are important food and ceremonial animals for Indigenous people, also feed on them.'

'For the Northern Australian Marine Biodiversity Survey, the opportunity to bring together regional marine planning coordinated by the National Oceans Office, and conservation planning coordinated by the Director of National Parks, provided the potential to ensure a broader geographic coverage, more efficient use of funds, and to encourage the use of standardised methods across the area to facilitate regional comparisons and planning,' said Rowan Wylie.

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Engaging local knowledge

As the scoping study gained pace, the National Oceans Office joined forces with Parks Australia, the Northern Land Council (set up to manage the interests of Traditional Owners), and the Northern Territory Government (Museum and Art Gallery of the Northern Territory and Department of Infrastructure Planning and Environment), with support from the Australian Government's Natural Heritage Trust, to undertake a collaborative marine survey with Traditional Owners and Indigenous Sea Ranger groups – self-organised community groups that oversee the northern coastal waters. Included were the Mardbalk Rangers (Goulburn Islands), Djelk Rangers (Maningrida), Wanga Djakimirr Rangers (Ramingining) and Traditional Owners from Murrunga Island.

Over three months the survey planning team, which included representatives from these organisations, visited Aboriginal communities to discuss the aim of the survey, seek permission to work in the region, identify the issues and knowledge needs of the Aboriginal people, and to gather local knowledge about seagrass bed locations.

'We had a broad idea of where we'd like to sample, and when we discussed this with the Aboriginal people they were able to show us on maps where we could expect to find seagrass,' said Terry Mahney of the Northern Land Council.

'Many of these areas correlated with good hunting places for turtles and dugong, including one unusual seagrass area in deep water off the coast, which a subsequent helicopter survey didn't pick up. We were also careful to identify areas

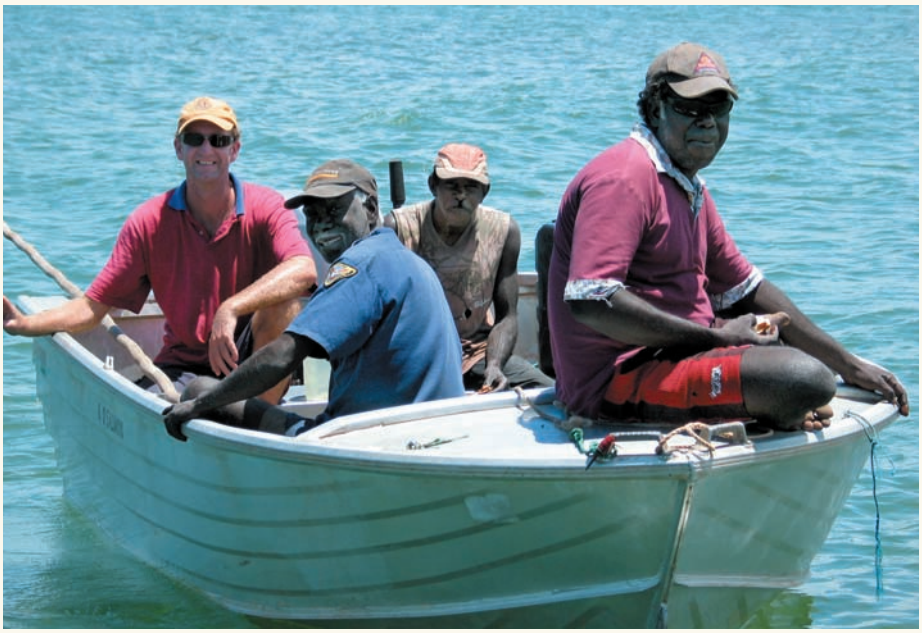
that were sacred or that were not appropriate to focus on for cultural regions.'

Dr Ilse Kiessling of the National Oceans Office says the survey proposal was greeted enthusiastically by Aboriginal communities, who want more information to both improve their own knowledge and to utilise for management purposes.

'Aboriginal people are keen to work with biologists to learn more about the animals and the environment so that they're in a position to engage more effectively with decision-makers about management activities,' she says.

Over the three-month consultation, the team also put together an innovative Communications Strategy with Aboriginal colleagues to ensure the research activities, use of results and intellectual property, and communication processes, were agreed upon before the project started.

'We developed basic courtesy and information sharing protocols which have been a significant outcome of the project and that will hopefully provide a strong foundation for future work of this kind,' Dr Kiessling says.



Mardbalk Rangers from Warruwi Community on Goulburn Island surveying the mouth of the King River – Terry Mahney (NLC), Henry Imberamana, Robert Djorlam Jnr. and Roy Wununguj (left to right). Northern Land Council

The value of local knowledge

Following the consultation process, a helicopter survey of the region was conducted in November 2004 to broadly map seagrass beds. Applying techniques developed by the Queensland Department of Primary Industry's Northern Fisheries Centre, the flights mapped the distribution, structure and composition of intertidal and shallow sub-tidal seagrass communities from Kakadu National Park to the tip of Cape York.

In December, an intensive vessel-based survey aboard two chartered fishing vessels, the *Hyland C* and *Swordfish*, was then undertaken, with Aboriginal people and scientists working side-by-side. Using a range of methods to sample seagrass habitats and adjacent areas, 217 samples were collected from the Kakadu National Park coastline and 171 along the Arnhem Land coast between the Goulburn Islands and Castlereagh Bay. Local Aboriginal communities, such as Sea Ranger groups, were involved in directing vessels to appropriate seagrass areas and collecting and identifying marine organisms. Local knowledge about these organisms was documented as much as possible.

'Working with Aboriginal people throughout the development and implementation of the survey was invaluable,' Dr Kiessling says.

The survey turned up a number of species previously unknown to science and many species records that are new for the areas surveyed. Early results suggest biodiversity is probably richer along the Arnhem Land coast than previously thought, possibly due to the greater diversity of bottom-types – muddy, sandy and rocky – in the area.

Some of the samples are now being identified by taxonomic experts around the country and will be logged for future planning purposes.

'This information will give us a better understanding of the biological components of the ecosystems along the Arnhem Land coast. We'll use it to help identify areas or organisms that are significant from an ecological perspective, that have conservation value, or that could be worth investigating further,' Dr Kiessling says.

The survey could also lead to a species inventory, in which the scientific and Indigenous names of each organism are documented, and web pages, posters and guide books on the different plants and animals for the education of Aboriginal and non-Indigenous school children.

Importantly, the essential findings of the survey will be reported to the Aboriginal people before being released more generally – a condition of the Communications Strategy established during the consultation period. The survey partners will also discuss with them the best way of using any Indigenous knowledge in the final publication and future products.

Those involved in the survey hope that it acts as a stepping-stone to both future collaborative activities and greater recognition of the importance traditional knowledge can play in scientific research and resource management. It should also help contribute to Aboriginal people gaining the confidence and information they need to work with government and scientists. Through promoting the sharing of knowledge between scientists and Indigenous communities, members of the Marine Biodiversity Survey have begun building a strong and invaluable foundation for better management of all our marine environments.

● **Wendy Pyper**

More information:
Northern Regional Marine Planning publications: www.oceans.gov.au/publications_north.jsp

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